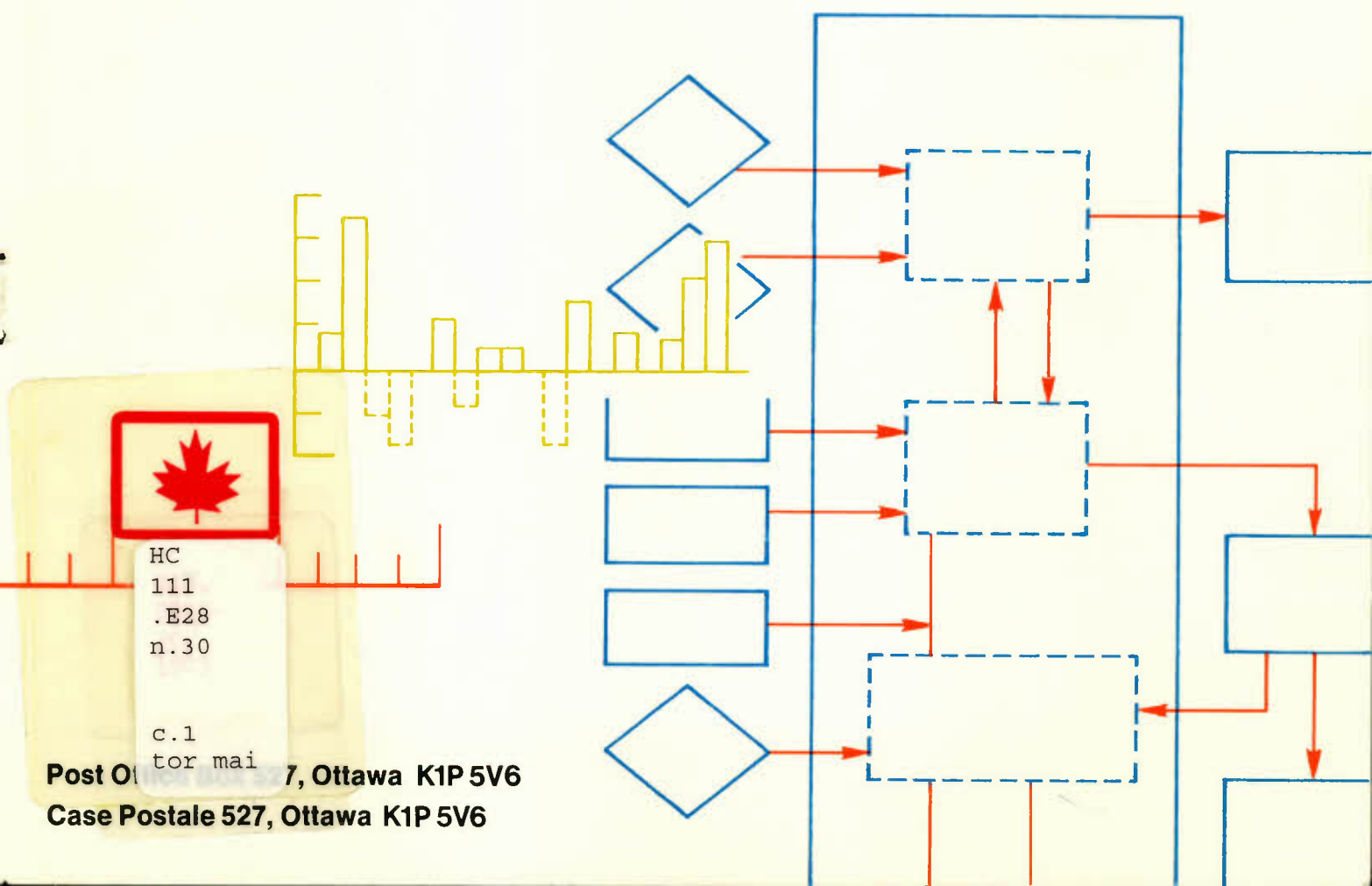
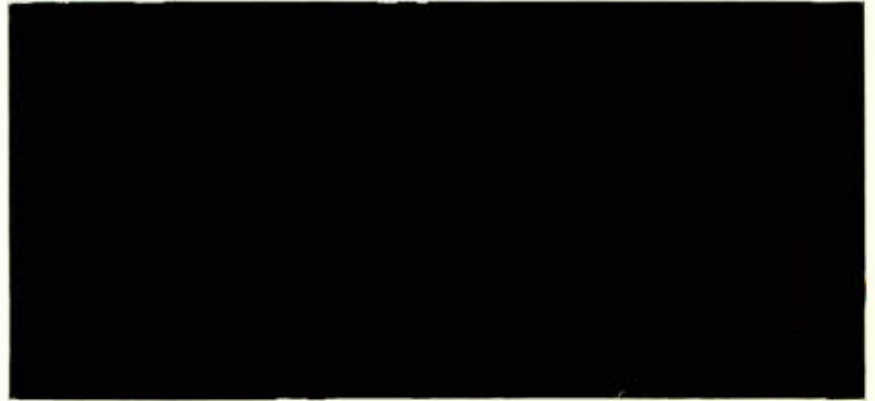




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DISCUSSION PAPER No. 30

Price-Level Targets in an Open Economy

by Richard E. Caves



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March 1975



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## Summary

In this paper, Richard E. Caves considers a small open economy operating under a fixed exchange rate and later under a flexible exchange rate. He finds that "pervasive economic forces tend to make (the Canadian) rate (of inflation) the same as in the country's principal trading partners, and any standard or target that denies these forces seems doomed to frustration". The ensuing discussion raises several problems in the construction and implementation of a flexible inflation standard and suggests various areas of future research.

The paper begins by showing the macroeconomic implications of an inflationary disturbance on a small open economy with a fixed exchange rate. Using a monetarist model with some fairly restrictive assumptions, Caves shows the economy to be spared the consequences of domestic inflationary disturbances but to be subject to disturbances in the rest of the world. He supports these conclusions by tracing an increase in foreign prices through both a Keynesian and an extended monetarist macroeconomic mechanism. Both yield the same predictions -- an ultimate increase in aggregate demand in the small open economy (Canada) and thus a tendency to increase prices. To the extent that foreign prices feed directly through product and factor markets, the smaller are the macroeconomic disturbances. Channels of transmission may vary but there is no escaping inflation occurring abroad.

Returning to his initial monetarist model but assuming a flexible exchange rate, Caves admits the theoretical absence of international inflationary transfer. He notes, however, an

historical failure of flexible exchange rates to insulate domestic price levels from those abroad -- particularly those of the United States. Two possible explanations are offered for this discrepancy.

Having established the international transmission of inflation, in practice if not in theory, Caves concludes that the only standard suitable for Canada's rate of inflation is one pegged to rates of inflation abroad -- a standard similar to that proposed by the Economic Council. He agrees that the weights should reflect gross trade in goods and services with the chief trading partners but he wonders if the United States might be under-represented due to non-trade channels of inflation. Research in this area, together with other aspects of the operation of the floating standard, is recommended.

One potential area for investigation is in the matter of timing. There exist lags in both the arrival of inflation coming from abroad and in the calculation of the standard and implementation of policies based upon it. Another area requiring study is the possible existence of real disturbances requiring a shift in Canada's inflation rate away from that indicated by the floating standard.

Caves closes the paper by comparing a fixed percentage standard with a floating policy standard. He suggests that since the latter makes no fruitless attempt to ward off foreign inflationary disturbances, it avoids the consequent displacement of aggregate economic activity and uneven impacts on individual sectors. Furthermore the two standards have different implications for policy instruments. A basic choice involves the commitment to a fixed or flexible exchange rate -- a flexible standard makes sense only if the exchange rate is fixed or operates as if it were fixed.

## Résumé

Dans ce document, Richard E. Caves étudie comment fonctionne une petite économie ouverte, d'abord en régime de taux de change fixe, et ensuite en régime de taux flexible. Il constate que des forces économiques puissantes ont tendance à maintenir le taux canadien d'inflation aussi élevé que celui de nos principaux partenaires commerciaux, et que toute norme ou objectif qui refuse d'admettre ces forces est voué à l'échec. L'auteur soulève ensuite certains problèmes touchant l'élaboration et la mise en oeuvre d'une norme flexible d'inflation, et délimite divers domaines pour la recherche future.

Il montre d'abord les implications macro-économiques d'une perturbation inflationniste sur une petite économie ouverte ayant un taux de change fixe. En utilisant un modèle monétaire fondé sur des hypothèses passablement restrictives, Caves démontre que l'économie ne sera pas touchée par les conséquences de perturbations inflationnistes intérieures mais qu'elle sera exposée aux perturbations qui affligent les autres pays. A l'appui de ces conclusions, il reproduit une augmentation des prix étrangers à l'aide d'un mécanisme keynésien et d'un mécanisme macro-économique monétaire élargi. Les deux mènent aux mêmes résultats soit une augmentation ultime de la demande globale dans une petite économie ouverte (le Canada) et, par conséquent, une tendance à augmenter les prix. Plus les prix étrangers ont un impact direct sur les marchés des produits et des facteurs, plus les perturbations macro-économiques sont petites. Les moyens de transmission peuvent varier, mais il est impossible d'échapper à l'inflation qui sévit à l'étranger.

Reprenant son premier modèle monétaire mais cette fois avec un taux de change flexible, Caves admet l'absence théorique

de transferts inflationnistes étrangers. Il remarque toutefois que, par le passé, les taux de change flexibles n'ont pas réussi à isoler les niveaux de prix intérieurs de ceux qui ont cours à l'étranger, en particulier de ceux des Etats-Unis. Cette apparente contradiction peut s'expliquer de deux façons.

Ayant établi le fait de la transmission internationale de l'inflation, en pratique sinon en théorie, Caves en arrive à la conclusion que la seule norme convenable pour le taux d'inflation au Canada est celle qui serait établie d'après les taux étrangers, norme qui s'apparente à celle que propose le Conseil économique. Il admet que les pondérations doivent être établies suivant le commerce de biens et services avec nos principaux partenaires commerciaux, mais il se demande si les Etats-Unis sont suffisamment bien représentés étant donné l'importance des canaux d'inflation non-commerciaux. Il recommande que des recherches soient entreprises dans ce domaine, de même que sur les autres aspects du fonctionnement d'une norme flexible.

La question du chronométrage est aussi un domaine potentiel de recherche. Il existe des décalages tant dans les manifestations de l'inflation provenant de l'étranger que dans le calcul de la norme et la mise en oeuvre de politiques fondées sur elle. Il faudrait aussi étudier l'existence possible de perturbations réelles exigeant un taux d'inflation canadien différent de celui indiqué par la norme flexible.

Caves conclut par une comparaison entre une norme fixe exprimée en pourcentage et une norme flexible. Etant donné que cette dernière n'entraîne aucun effort pour combattre les perturbations

inflationnistes étrangères, l'auteur prétend qu'elle évite le déplacement dans l'ensemble de l'activité économique qui en résulterait ainsi que les répercussions inégales dans les secteurs particuliers. En outre, les deux normes ont des implications différentes pour les instruments de politique. Il s'agit donc fondamentalement de choisir entre un taux de change fixe ou flexible; le choix d'une norme flexible n'est logique qu'à la condition que le taux de change soit fixe ou qu'il fonctionne comme s'il l'était.



## Introduction

In its Tenth Annual Review, the Economic Council of Canada concludes that the price level in an open economy like Canada's depends heavily on the movement of prices abroad. Taking account of any change in its exchange rate, a country's inflation rate can differ only temporarily from that abroad-- in the Council's view perhaps five to ten years for countries well insulated from international commerce much less for open economies like Canada. Any tendency for the Canadian price level to inflate at a divergent rate will ultimately be reined in by market forces, although it may cause various difficulties for economic policy along the way. By the same token, no policy target for movement of the Canadian price level is attainable if it diverges from the international rate of inflation.

After making this interpretation of the external forces governing the Canadian price level, the Council concludes that any meaningful public standard for the price level must be pegged to the movements of prices in Canada's principal trading partners. Only if Canada's inflation rate strays outside a band of one percentage point more or less than the average of these trading partners is there "need for both close analysis and possible policy action."<sup>1/</sup>

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<sup>1/</sup> Economic Council of Canada, Tenth Annual Review: Shaping the Expansion, 1973 (Ottawa: Information Canada, 1973), pp. 57-58, 64-66.

This essay draws on the analytical tools of international economics to provide background to this proposal and to develop some of its implications. I shall not be concerned with the procedural problems of giving effect to such a standard. I assume that some such standard will be employed, and compare the properties and merits of the new standard set forth by the Economic Council to a traditional standard employing a fixed target rate of inflation. The first two sections review the international linkages that can transmit inflation to and from the Canadian economy and show why the flexible target is economically superior. The third section considers the influence of exchange-rate flexibility, and the fourth explores various problems of construction and implementing this flexible inflation standard.

1. A Simple Model of International Price Linkages

As general background to this discussion it is important to set forth the mechanism by which the price levels of trading countries are kept in line with one another when the exchange rate is fixed. The microeconomic foundations of this mechanism are evident enough: if the price of newsprint is the same everywhere in the world and rises outside of Canada, the Canadian price must rise as well. But the macroeconomic structure of the model is somewhat more subtle and contains important implications for economic policy.<sup>1/</sup> I shall assume first that Canada

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<sup>1/</sup> This model is set forth in greater detail in my "Looking at Inflation in the Open Economy", Inflation, Trade, and Taxes: Essays in Honor of Alice Bourneuf, ed. David A. Belsley et al. (Columbus: Ohio State University Press, 1975).

is too small a producer to influence the world prices of any of the goods and services it trades internationally, that all goods and services produced are traded internationally at prices unaffected by tariffs or international transport costs, that all Canadian-dollar prices are competitively determined and flexible, and that the exchange rate is pegged in the traditional way -- some monetary authority (Canadian or foreign) stands ready to buy or sell unlimited quantities of Canadian dollars at the going exchange rate. I shall develop the economic relations in terms of a one-shot disturbance, which suffices to capture the essentials of a continuing inflationary process so long as we assume people do not expect the inflationary disturbance to continue and build it into their asset-holding plans.

A major point about international linkages is that they save a country from the effects of its own inflationary disturbances just as they inflict on it inflationary disturbances originating in the outside world. Assume that some disturbance increases money expenditure in Canada, such as a decision by the public to hold smaller cash balances relative to the current level of money expenditure. If the economy were closed, the traditional "monetarist" model of course holds that prices would be bid up until the cash balances the public desires at the elevated level of money expenditure again equal the money supply in public hands. But with the economy open and all goods traded, the excess demands for traded goods created by the extra total expenditure have no perceptible effect on their world

prices. Instead, the extra expenditure spills over into an excess demand for foreign currencies in terms of the Canadian dollar. The monetary authority in charge of stabilizing the Canadian dollar's value increases its holdings of Canadian dollars and reduces its foreign-exchange holdings by an amount equal to the excess demand. The economy experiences a net trade deficit equal to the monetary disturbance, consisting of reduced exports and increased imports in proportions governed by Canada's marginal propensities to spend on these classes of goods. (If most of an extra dollar of outlay goes to importable manufactures rather than exportable specialized raw materials, the shift of the trade balance occurs mostly through increased imports.) The "inflationary" disturbance thus leads to a temporary increase in Canadian consumption and an equal reduction in the country's net international assets. But the Canadian price level is unaffected.

If the inflationary disturbance occurred in a large country -- say, the United States -- the effect would be different.<sup>1/</sup> The excess demand spilling over onto international traded-goods markets drives up their prices measured in any and

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<sup>1/</sup> The distinction between "large" and "small" in this context is that a change in a large country's excess demand for internationally traded goods influences their world prices; given the source of disturbance I am assuming, what matters is the size of the country's consumption relative to world consumption, not the size of its production of individual commodities relative to world consumption of those particular goods.

all currencies. The public in the rest of the world, facing increased money prices of traded goods, feel the need to augment their cash holding in line with their increased level of money expenditure. The public outside the United States temporarily reduce their real expenditure in order to recoup the normal relation they desire between their cash balances and money expenditure levels. They can indeed add to their nominal balances, because monetary authorities are being forced to buy U.S. dollars and sell foreign currencies in order to avert changes in exchange rates. The new equilibrium for world prices and cash balances is easy to describe in this monetarist model where the public in each country are assumed to hold cash balances in some stable proportion to their money expenditure. Because with fixed exchange rates prices must increase by the same proportion everywhere, so must nominal cash balances. The ultimate source of this increase in the world's nominal cash balances is the one-shot reduction in balances initiated by United States spenders (converted as necessary into foreign exchange when monetary authorities buy U.S. dollars and sell other currencies at fixed exchange rates). Therefore, the proportional increase in world prices must be equal to the ratio of the initiating reduction in U.S. cash balances to the initial world money supply. This model makes it clear why nations should worry more about inflationary processes under way in large trading partners than in small countries.

Now return to the situation of a small country like Canada and consider the effects of an inflationary disturbance originating abroad. The source of the disturbance does not matter so long as it leaves the relative prices of internationally traded commodities unaffected. If world prices increase and Canada's exchange rate stays unchanged, it is impossible to prevent an equal increase in the Canadian price level. If the Canadian exchange rate remains unchanged, the money prices of internationally traded goods rise in Canada -- imported goods, domestic output in direct competition with them, and exportable goods whose prices are determined on world markets. Even with money incomes increased for those engaged in the production of these goods, the Canadian public will find their previous level of nominal cash balances inadequate to finance their increased volume of money transactions. They will tend to reduce their expenditures temporarily in an attempt to restore the desired real value of their money balances. If the Bank of Canada supplies the extra cash balances that are demanded, there is no disturbance to Canada's trade balance. But if the Bank resists the transfer to Canada of the inflationary increase in world prices, reduced demand for tradable goods in Canada reduces imports and frees exportables for sale abroad, thereby improving the trade balance. The external value of the Canadian dollar tends to rise. The monetary authorities stabilizing its exchange rate must sell dollars, and in doing so supply the Canadian public with the desired increase in nominal cash balances.

Thus, so long as the exchange rate remains fixed, Canadian authorities can prevent neither the rise in the price of traded goods nor the acquisition by the public of cash balances that will "validate" the inflation by restoring equilibrium in transaction balances. Thus, on the extreme assumptions of this model, a small country like Canada finds itself completely vulnerable to inflationary disturbances in the rest of the world, just as it is relieved from the consequences of inflationary disturbances originating at home.

The conclusions of this static model are obviously sensitive to changes in its assumptions. One inessential assumption, however, is the absence of nontraded goods. In the preceding analysis, inflationary disturbances within a small country were not permitted to affect the prices of traded goods when excess demands arose for them. That may or may not be a reasonable empirical assumption, because it depends on the speed with which transitional disequilibria are eliminated in domestic markets for traded goods. When the mix of goods consumed by a country includes nontraded goods, however, we must expect that excess demands will drive up competitively determined prices. Therefore, an inflationary disturbance to the Canadian expenditure circuit should inflate the prices of nontraded goods, even if traded-goods prices stay locked to their world levels. If we retain the rest of the model's assumptions, however, this inflation of nontraded-goods prices must be temporary. The process was described above whereby the temporary increase in real

expenditure associated with an inflationary disturbance produces a trade deficit that is financed by a reduction in the country's "excess" financial assets (money balances). It can be shown that full equilibrium can be restored to commodity markets and the public's assets-expenditure relation only when real and money expenditure and the prices of nontraded goods have all returned to their levels before the disturbance. The reason why nontraded goods' prices cannot be permanently inflated by this process is that real incomes and the money prices of traded goods do not change; the equilibrium relative prices of nontraded goods are unaffected, and their money prices must therefore also return to their former levels.

## 2. Channels for International Transfer of Inflation

This model helps to clarify the basic dependence of a small country like Canada on price-level movements among her trading partners. Yet, because of its restrictive assumptions, it probably gives too weak an impression of the linkages that tie Canada's price level to the rest of the world's. So long as the exchange rate does not change, price movements abroad can be transmitted to Canada via a number of channels -- their nature and importance depending on the structure of the economy and the management of economic policy. After enumerating these channels, I shall argue that they are substitutes for one another, and inflation abroad will spill into Canada via one channel if not via another.



Suppose that prices are rising abroad but not (yet) in Canada. Two distinct macroeconomic mechanisms operate to expand aggregate demand in Canada and thereby pull Canadian prices up. First, as foreign prices rise Canadian goods become cheaper to the rest of the world, foreign goods dearer to Canadians. An improvement occurs in the balance of trade in goods and services, which in turn raises Canadian national income through the familiar Keynesian multiplier process. This mechanism tends to continue its effects on the price level until the favorable trade balance is eliminated which presumably occurs when Canadian prices have caught up with those abroad.

A second macroeconomic mechanism is that identified in the "monetarist" model developed above. The improving trade balance that results from inflation abroad creates excess demand for the Canadian dollar and forces the government to increase the money supply in the hands of the public, in order to maintain the (assumed) fixed exchange rate. Suppose that an attempt is made to sterilize this increase in high-powered money, by keeping the domestic assets used for exchange stabilization and deposits in the banking system. This sterilization process works, only if international capital flows are less than completely interest-elastic. If unlimited international capital flows take place following a small change in Canadian interest rates, sterilization becomes impossible. To the extent that the Canadian public want to hold extra cash balances because of increased net sales of goods and services abroad, the Bank of Canada cannot deny them

the option. Any squeeze on cash balances tends to raise Canadian interest rates and attract capital from abroad. This inflow again forces the purchase of foreign exchange in order to stabilize the Canadian dollar's price, and the government restores with one hand any of the money supply it removes with the other. Thus, if an improvement in the trade balance induced by inflation abroad raises the cash balances of the Canadian public, and total expenditure depends on the level of cash balances (as "monetarist" models assume), we again conclude that inflation abroad expands aggregate demand in Canada and thereby tends to raise Canadian prices.

These two macroeconomic mechanisms -- essentially one Keynesian, one monetarist -- are not mutually exclusive as empirical channels for the transfer of inflation. Each depends on theoretical patterns of economic behavior that have proved broadly consistent with experience. Thus, whatever the strength of the rival debaters in the Keynesian-monetarist debate their models generate the same prediction that in inflationary disturbance to foreign prices will, with exchange rates pegged, increase aggregate demand in Canada and thereby tend to increase prices. The specific quantitative predictions of the two mechanisms should differ, of course, but each mechanism operates so long as an inflation-induced improvement in the trade balance persists and ceases once it is eliminated.

These macroeconomic channels come into play to the extent that foreign price increases do not directly elevate Canadian-dollar prices within individual markets. On the other hand, so far as foreign price increases feed directly through to Canadian prices, the macroeconomic disturbances to real aggregate demand in Canada associated with shifts in the trade balance are reduced. These price linkages depend on not just the increase in Canadian dollar prices of imports but also on the adjustment of the prices of Canadian goods competing with imports. They also depend on how the domestic prices of Canada's exportable goods behave when their world prices rise; sometimes imperfect competition or interventions of public policy delay the adjustment of domestic prices of exportables, but sellers' efforts to equalize the marginal profitability of sales in all markets tend to bring the adjustment about. Finally, Canadian prices may be linked to those abroad through factor markets as well as product markets. Much attention has been given to the effect of wage settlements reached in the United States on unit labour costs in Canada. To the extent that wage bargains transmit inflationary pressures built up outside Canada, they provide yet another conduit whereby Canadian inflation is tied to inflation abroad: if Canadian prices are not directly elevated by foreign price increases, they may be pushed up via indirect effects through factor markets on Canadian costs of production. And for any given Canadian industry, this particular kind of cost-push inflation can come through the markets

for imported raw materials or intermediate goods just as much as through the market for labour (and other primary inputs). Once again we conclude that the various channels for the international transmission of inflationary forces are substitutes for one another: if a general inflation is occurring abroad, it reaches Canada through one channel or another. Efforts of public policy to stop up one channel simply shift the pressures to another. Although it would be desirable to know much more than we do about the relative importance and speed of these different channels,<sup>1/</sup> that knowledge would be of the "fine tuning" variety and would not affect the fundamental truth of the Canadian economy's ultimate vulnerability to inflation taking place abroad.

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<sup>1/</sup> Here is a brief bibliography of the chief empirical studies of these inflationary links: Lester D. Taylor, Stephen J. Turnovsky, and Thomas A. Wilson, The Inflationary Process in North American Manufacturing (Ottawa: Information Canada, 1973); Bryan M. Downie, Relationships Between Canadian-American Wage Settlements: An Empirical Study of Five Industries, Research Series No. 18 (Kingston: Industrial Relations Centre, Queen's University, 1970); Robert M. Dunn, "Flexible Exchange Rates and Oligopoly Pricing: A Study of Canadian Markets", Journal of Political Economy, 78 (January/February, 1970), 140-151; idem, "Flexible Exchange Rates and Traded Goods Prices: The Role of Oligopoly Pricing in the Canadian Experience", The Economics of Common Currencies, ed. H. G. Johnson and A. K. Swoboda (London: George Allen and Unwin, 1972), chapter 16; John M. Curtis, "Direct Foreign Influences on Canadian Prices and Wages", in R. E. Caves, G. L. Reuber, et al., Capital Transfers and Economic Policy: Canada, 1951-1962 (Cambridge: Harvard University Press, 1971), chapter 5; M. G. Kelly, The Short-Run Impact of Foreign Inflation on Canadian Prices (Ottawa: Information Canada, 1972).

### 3. Exchange-Rate Flexibility and Price-Level Interdependence

The argument so far has explored the reasons why a small country with a fixed exchange rate is tied to the inflation rate of the rest of the world. Yet Canada's exchange rate has been without a formal pegged value since 1970, as it was between late 1950 and mid-1962 as well as earlier periods. Although the exchange market has never been totally free of official intervention, it certainly has been allowed to make substantial responses to the forces of the market. I shall consider why a purely flexible rate is often thought to free a nation's price level from dependence on foreign price movements, then the reasons why this flexibility is not fully attainable in practice.

Return to the abstract model employed in section 1 above, but make the Canadian dollar's price flexible and competitively determined in international currency markets. Again suppose that an inflationary disturbance occurs in Canada, in the form of a decision by the public to hold a lower level of cash balances. The resulting excess demand for goods translates itself as before into an excess demand for foreign exchange. But no monetary authority stands ready to make up that excess demand, and the price of foreign exchange rises. At the same time the Canadian-dollar prices of traded goods rise; product-market competition keeps the domestic price equal to the foreign price at the going exchange rate. The process of depreciation and domestic inflation goes on until the Canadian public

are satisfied with the unchanged stock of nominal cash balances that they hold, now reduced in real value by the inflation. The Canadian economy can no longer vent its inflationary disturbances on the outside world.

The effects of inflationary disturbances abroad symmetrically alter the exchange rate but not Canadian prices. Any rise in foreign prices of traded goods generates an excess supply of them in Canadian markets and thereby an excess supply of foreign exchange. The Canadian dollar thus comes into excess demand and its price rises. No monetary authority now releases additional cash balances to the Canadian public, and so the equilibrium level of real and monetary expenditure in Canadian dollars remains unchanged. There can be no increase in Canadian prices, and the economy is insulated from price movements abroad.

Although this matter has not been studied closely, the Canadian price level has appeared to move very closely with those of its principal trading partners -- especially the United States -- even in periods when Canada's exchange rate was largely market-determined.<sup>1/</sup> The fact that the exchange rate against the U.S. dollar differs little from its value twenty years ago is

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<sup>1/</sup> I once explored the correlation between Canadian and United States price indexes in the 1950s with the intention of measuring the degree to which non-synchronous price changes were associated with movements of the exchange rate. But the correlations between comparable price indexes in the two countries proved to be so high that there was essentially nothing left to explain!

almost sufficient testimony to the lack of any ex post independence for the Canadian price level. What factors explain this gross discrepancy between the price-level independence predicted by economy theory and the enslavement that we apparently find in practice? The following suggestions are speculative and untested empirically (notice that they could be subjected to empirical test):

1. Some foreign businesses and financial institutions hold inventories of Canadian currency, and many Canadian traders can hold their liquidity in either domestic currency and foreign exchange. A good deal of evidence suggests that these market participants generally have inelastic expectations about the market value of the Canadian dollar. That is, when its spot price rises, they revise their expectations about its future price upward by a smaller percentage. At the extreme, they may often expect that it will sooner or later return to a "normal" value at or near parity with the U.S. dollar. If they act as profit-maximizing speculators on the basis of these expectations, they sell the Canadian dollar whenever its price rises and buy when it falls. This action stabilizes the exchange rate and affects the money supply in "domestic" circulation in exactly the same way as if the Bank of Canada were guarding a target value of the dollar through foreign-exchange operations. It is impossible

to say from empirical evidence how potent or sustained is the force of stabilizing speculation about the Canadian dollar. Convincing evidence holds that it is quite potent in the short run. But the rate has evidently undergone significant changes in periods when it was market-determined. One cannot say that stabilizing speculation keeps the rate permanently locked in place. But then neither does an "adjustable peg" in the face of a sustained disequilibrium, because somebody eventually runs out of reserves.

2. Suppose that the producers of traded goods made and consumed in Canada are often imperfect competitors. When prices rise abroad, they mark up the Canadian-dollar prices of these goods without the intervention of any explicit excess demand (in Canada for imports, or by Canadians for exportable goods). By doing so, they can preclude the appearance of any excess demand for Canadian currency that would drive up its price. On a monetarist interpretation these elevated prices would leave the Canadian public dissatisfied with the adequacy of its cash balances and induce it to reduce its expenditure in an attempt to build up their real value. This reduction is deflationary in its direct effect on output and employment in Canada, and also in its tendency to drive up the external value of the Canadian dollar. But Canadian monetary and fiscal



authorities may intervene at this point, to head off this deflationary pressure. If the public's demand for extra cash balances is required, or aggregate demand otherwise stimulated, the policy action effectively "validates" the marked-up Canadian prices and restores macroeconomic equilibrium with inflation imported from abroad. Thus, a combination of traded-goods prices directly linked to those abroad and a money supply "endogenous" in this sense could restrict the insulating power of the Canadian exchange rate. This process sounds rather devious, and it is hard to find empirical evidence that supports it directly. Nonetheless, I believe that it may contain important grains of truth to explain the failure of the flexible exchange rate to insulate the Canadian price level. Note that sellers' expectations that Canadian prices will ultimately follow external (especially U.S.) prices support the operation of this mark-up process; it is not just an arbitrary artifact of a few peculiarly imperfect markets.

Neither of these hypothetical explanations of the historical failure of exchange flexibility to liberate the price level proves that exchange flexibility is ineffectual under all circumstances. The first mechanism is short-run and could not circumvent exchange-rate movements if underlying forces propel

foreign and domestic inflation along at persistently differing rates. The importance of mark-up pricing in any case depends on the presence of congenial market structures and the collaboration of the authorities in "validating" upward pressure on prices originated abroad; there is no reason why Canadian prices should mechanically and directly follow foreign ones if demand conditions make the adjustment systematically unprofitable to sellers. Thus the historical failure of exchange-rate changes to insulate the price level does not condemn out of hand its potential as a policy instrument.

4. Operating Features of a  
"Floating" Policy Standard

The discussion so far supports a very simple conclusion about the Economic Council's proposed "floating" standard for Canada's rate of inflation. Pervasive economic forces tend to make that rate the same as in the country's principal trading partners, and any standard or target that denies these forces seems doomed to frustration. Thus the standard proposed by the Council is fundamentally the right one. To invert the proposition, any standard that departs from a rate related to the common international one can be viable only if the flexible exchange rate is "managed" to make it change at a rate equal to the difference between the foreign inflation rate and the Canadian policy standard. Although the theoretical analysis suggests that a small trading country with its exchange rate formally or effectively fixed enjoys little freedom to control the movement of its price level, a standard pegged to rates abroad remains

the only one that should accompany whatever policy efforts along these lines do seem productive.

This conclusion appears to hold no matter what use is intended for the policy standard. Two types of uses are plausible. First, the one explicitly considered in the Council's Tenth Annual Review would be to determine the proper intensity of action to be taken against inappropriate levels of aggregate demand and employment. If unemployment is too high the intensity of measures to combat it can be increased without much cost of increased inflation so long as the inflation rate in Canada lies below that prevailing in her trading partners, because the lower rate can probably not be sustained. Greater caution is needed if it lies above the foreign rate. The other side, high employment and overheating in the Canadian economy, is less dangerous if inflation is below the foreign level, because inflation in Canada will in any case tend to be pulled up to the rate running abroad. The second use of the policy standard might be for direct suasion against price increases in those sectors where the sellers of labor and/or final output are highly concentrated and potentially responsive to intervention. The amount of political goodwill worth sacrificing in this endeavour is presumably greater when Canada's inflation rate is at or above those of her trading partners than when it lies below.

I now turn to a group of questions concerning the construction of the standard and its operation in the face of various international and domestic disturbances. In the process I shall point out certain dangers inherent in its use and some research needed to assess its prospects.

Weights for the Policy Standard

Are the weights employed in the policy standard the optimal ones? The analysis set forth above showed how inflation is transferred through trade in goods and services. In general it proceeds symmetrically through Canadian imports and exports. Hence the correct weights are clearly the ones proposed by the Council -- Canada's gross trade in goods and services with her chief trading partners. There are a few qualifications and questions to be raised, however.

First, is it appropriate to omit direct investment from the weights? There are two reasons why it deserves some consideration. The flow of direct investment may be important because it is the one capital movement that should be systematically influenced by differing rates of inflation. If Canada's inflation rate lies below that of country x, multinational companies based in both countries find Canada an increasingly attractive (or decreasingly unattractive) place in which to produce. The outflow of direct investment from Canada to x declines and the inflow increases. Correspondingly, the rate of real capital formation in Canada is stepped up, and inflationary pressure augmented.<sup>1/</sup> The stock of direct investment may also be significant in transferring inflation, for reasons briefly noted above. Multinational companies

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<sup>1/</sup> See John H. Makin, Capital Flows and Exchange Flexibility in the Post-Bretton Woods Era, Essays in International Finance, No. 103 (Princeton, N.J.: International Finance Section, Princeton University, 1974).

operating in Canada may tend to increase their Canadian prices in a linked administrative decision when they raise their prices abroad. Curtis's research (Caves and Reuber, chap. 5) weakly supports this hypothesis, which implies that inflation in a foreign country is more readily transmitted to Canada the larger are the gross sales of foreign subsidiaries in Canada belonging to firms domiciled in that country.

If the flow and stock of foreign direct investment are significant links in the transfer of inflation to Canada, their practical import for the policy standard is probably to suggest that weights based solely on trade underrepresent the United States. This possibility is also suggested by another non-trade channel of inflation transfer noted above: that Canadian wage settlements may follow those in the same industry in the United States, especially where an international union, close geographic proximity, or other institutional link operates.

Research should be undertaken on the implication of these hypotheses that a trade-weighted policy standard underrepresents the influence of United States prices and factor costs. One approach would be to relate changes in Canadian price indexes to changes in comparable indexes in the U.S. and other countries, using a procedure that imputes a weight to the role of each trading partner (beta coefficients or analysis of variance). This procedure could also be used to make sure that no important countries have been omitted. This possibility is perhaps worth consideration because foreign

countries' importance in transmitting inflation to Canada depends on the size of inflationary disturbances emanating from them as well as the scale of their trade linkages to Canada. It is conceivable (if not likely empirically) that inflation transmitted to Canada via trade linkages with countries a ... i could originate primarily in disturbances originating in country j.

Should the calculation of the policy target take account of changes in exchange rates in the designated trading partners? The answer to this question is not completely clear. The model set forth in section 1 implies a negative reply. A devaluing country surely elevates its own subsequent rate of inflation, but at the same time it reduces inflationary pressure being transmitted to other countries. Its effect on the Canadian policy standard hence should wash out if the standard covers the experience of all countries capable of significantly influencing price-level movements in Canada. This negative conclusion might require modification, however. Political analysts of exchange-rate changes often claim that devaluation increases the inflationary pressure in the devaluing country by tempting the government into expansionary policies previously eschewed because of fears over their effect on the balance of payments. If exchange-rate changes alter the amount of "exogenous" inflationary disturbances to the system, they are no longer neutral in their impact on the world's weighted-average inflation rate.

Lags in Policy Standard and Market Forces

There is a question of timing in the adjustment of the policy standard in response to changing inflation rates abroad and in the transmission of the economic impact of those changes to the Canadian economy. The theoretical merit of the flexible policy standard lies in its ability to detect the inflation rate that is inevitably being inflicted on the Canadian economy from outside. The static analysis of international inflation established the advantages of having the Canadian policy-standard rate equal to the inflation rate simultaneously prevailing abroad. In practice a series of lags affect both (1) the arrival of inflation transmitted from abroad and (2) the adjustment of the policy standard and of policies based upon it. Let me take them up in turn.

- (1) Each of the channels of inflationary transfer identified above is subject to its own set of lags. There is some empirical evidence on these, but it is piecemeal and not given to comparisons between the speed of adjustment process  $x$  and of adjustment process  $y$ . Furthermore, econometric analyses often select their lag structures arbitrarily and offer no evidence that the form actually chosen enjoys either theoretical or empirical superiority over alternatives. Therefore it is not fruitful to attempt a review of the available information here. Our theoretical result of section 2

carries a lesson for the analysis of lags. There we saw that the channels of inflation transfer are substitutes, so that price-level disturbances passing through one channel reduce the amount transmitted through one channel reduce the amount transmitted through others. If they operate with different speeds, the swift channels should drive out the slow ones, so to speak, and dominate the overall observed rate of international transfer of inflationary disturbances. The sectors of the Canadian economy that receive the initial brunt of the swifter channels of transmission correspondingly will appear to "lead" inflationary movements in Canada.

- (2) Changes in the posted policy standard and its applications also entail a series of lags. First of all, the collection and publication of data on price-level movements in foreign countries takes place with a lag, so that the inflation rate realized in a given quarter is known only some time after its close. A further lag might occur before the Canadian policy standard based on this information is calculated and made public. It then becomes an input into policy decisions, and a lag occurs before the settings of Canada's policy instruments are adjusted, and a further lag before the adjusted settings have their economic effect.



The question of timing concerns the match of these two sequences of lagged adjustments. Ideally, they would be about equal overall, so that the transmission of a foreign inflationary disturbance to Canada coincides with the effect of policy adjustments that take it into account. A discord in these two sets of lags implies (depending on the disturbance) transitional periods of either excessively expansionary or excessively contractionary domestic policies. Some research may be warranted into the duration and "shape" of these lags.

Sources of Disturbance and the Policy Standard

Should the policy standard retain its applicability no matter which international disturbances are affecting the Canadian economy? Probably not, because the adaptation to some disturbances generally requires a shift in Canada's rate of inflation relative to those in other countries. The key example is surely the absorption of long-term capital transfers. Consider a long-term capital transfer that is truly exogenous to Canadian macroeconomic conditions, such as an increased inflow of portfolio capital due to a decline in interest rates abroad, or an inflow of direct investment due to a natural-resource discovery in Canada. These inflows disturb the Canadian balance of payments. The extra purchasing power they place in the hands of Canadian residents is injected into the nation's expenditure circuits.

The traditional theory of the transfer process can be adapted to relate the subsequent developments to the process of inflation. That theory identifies under neoclassical assumptions a razor's-edge condition for Canadian and foreign marginal propensities to import; if that condition is satisfied, the current account of the Canadian balance of payments will shift by just enough to offset the capital inflow, thereby precluding any disturbance to the balance of payments, aggregate demand, or the price level in Canada. When we drop the neoclassical assumption of an unchanging level of real output and employment,

however, the question of whether or not a capital inflow leaves the price level unchanged is no longer equivalent to the question of whether or not it is required without a change in the exchange rate and/or terms of trade. In any case, research reported by Caves and Reuber (Chapters 1, 7) suggests that portfolio capital inflows tend to be both inflationary and underrequired in their effect on the Canadian balance of payments. Direct investment inflows are required or possibly overrequired, but nonetheless likely to be inflationary.

If Canadian policy allows long-term capital to flow internationally in response to commercial motives, it follows that aggregate demand must vary from time to time in response to capital-account disturbances. If an increase in aggregate demand generally implies some rise in prices as well as an increase in real output, Canada's rate of inflation necessarily varies relative to the world rate. If the policy standard were followed mechanically and policy toward aggregate demand adjusted by its dictate, the requiring of the real capital flows would be frustrated.

Behind this analysis lurk certain questions about the treatment of capital-flow disturbances. To what extent are they not exogenous, as this model assumes, but dependent on macro-economic conditions in Canada? If they are endogenous the leverage of policy upon them is increased and the policy problem identified above reduced. Should Canadian policy freely accept variations in international capital flows, when they can disturb

aggregate output and employment? One could certainly argue for blocking economically efficient capital flows if their short-term macroeconomic disturbances are too costly. But these incidental issues should not obscure the main conclusion that adjustments to capital flows or other real disturbances -- national or international -- may require a shift in Canada's inflation rate from that indicated by the policy standard.

Sectoral Impacts of Disturbances

Does the policy standard entail any systematic pattern of squeezes on or windfalls to individual sectors of the Canadian economy? It would contain seeds of danger if an important industry or region should experience recurrent depression or "unjust enrichment" under its operation. I can foresee no systematic problem of this type because sectoral impacts depend on the source and direction of future disturbances to the international economic system, and no reliable crystal ball is at hand. Nonetheless, let me explain how problems might emerge.

To make an even-handed comparison between the flexible policy standard and its alternative -- a fixed percentage standard -- I shall use the following assumptions. Make the Canadian inflation rate initially equal to the policy standard and to the rate prevailing abroad. Now allow the world rate to change (increase). The flexible standard duly adjusts upward; the alternative fixed standard stays put. With the fixed standard Canadian policy will resist the ingestion of more rapid inflation from abroad and create a higher level of unemployment than otherwise. The effect of retaining a fixed standard is to penalize sectors in quite differing proportions. Non-traded goods producers are worst off, because they simply face a reduced demand for their output. Next come the producers of import-competing differentiated manufactures, who face offsetting influences on their market position: the prices of

imported substitutes are rising, but the overall level of demand is restricted. Finally, producers of resource-based products for export unambiguously benefit because their price-cost margins are enlarged. This characterization of Canada's economic sectors is only a sketch, but it illustrates the chief influences at work. Of course, the effects of retaining a fixed inflation standard are the opposite if we reverse the direction of the disturbance and slow down the foreign rate of inflation relative to that in Canada. Thus the sectoral effects of choosing between a fixed and a flexible policy standard depend on the direction of disturbances affecting the system. They are a cause for concern only if the likely direction of disturbances can be foreseen.

Let me illustrate the point with one more example. The general rate of inflation can be affected by disturbances emanating from particular (world) product markets as well as from overall causes. For instance, an increase might originate either from a scarcity of raw materials or from a disturbance of the wage-price spiral variety in the manufacturing industries. These sources of sectoral price increase are inflationary if (money) prices are generally sticky downward and/or if public policy generally eschews imposing deflationary pressure on any important sector. These inflationary disturbances -- call them "raw materials" and "manufactures" respectively -- tend broadly to have opposite effects on Canada's terms of trade. Make the same assumption as before about initial conditions in Canada and

inject an inflationary disturbance from one of these two sources. In either case, retaining the fixed policy standard implies that the Canadian economy will face a higher level of unemployment as public policy seeks to ward off inflation from abroad. In the event of a raw-materials inflation, the choice of a fixed standard retards the elevation of costs for Canada's primary producers, conferring windfalls and encouraging the expansion of their outputs. If inflation occurs in manufactures, the effect on Canada's manufacturing sector is ambiguous, because (as before) demand is reduced in Canada (due both to lower employment and the effect of worsened terms of trade on Canadian real incomes) while the prices of substitutes are rising. The effect on Canada of an international decline in the prices of raw materials or of manufactures is, once again, the opposite of the effect of an increase.

It is now evident that there are no general conclusions. The sectoral effects of the choice between flexible and fixed policy standards depend wholly on the disturbances that are taking place. Yet a broader conclusion also comes through. The choice of the flexible standard averts displacing aggregate economic activity in Canada in a fruitless effort to ward off foreign inflationary disturbances. Thus the choice of the flexible policy standard averts effects both on aggregate activity and conditions in individual sectors.

What if inflationary disturbances originate not abroad but within Canada? A comparative assessment of the flexible

policy standard then becomes difficult. A truly fixed policy standard does not adjust to waxing and waning inflationary disturbances in the economy. The flexible standard adjusts only to those felt outside of Canada, and thus would reflect Canadian conditions only to the minor extent that Canadian inflation feeds through to affect inflation rates in her trading partners. The flexible standard therefore has direct implications for the handling of inflationary disturbances originating within Canada no different from those of a fixed standard. There may be a different political implication, however. The flexible standard is "objective" and logically defensible, and thus may be less vulnerable to political pressure for its adjustment than a fixed standard that is "a number out of the hat". Especially if the policy standard is used for moral suasion against price increases in concentrated sectors, there may be a case for nailing it to external forces. Yet this is a highly conjectural proposition, and a counter-argument can be made: a policy standard that changes its value periodically may attain little credibility for deterring actions that appear privately profitable to the sectors that initiate them. Thus no decisive judgment appears possible on the operation of the flexible standard in the face of domestic disturbances.



Choice of Policy Instruments

How does the flexible policy standard relate to the selection and setting of policy instruments in the Canadian economy? Like the previous question, this one does not yield an easy, compact answer. A basic choice for Canada is that between a fixed and a flexible exchange rate. The flexible policy standard makes sense only if the exchange rate is fixed, or operates as if it were fixed. I argued above that the flexible rate historically has allowed Canada little insulation of her price level. Yet the casual evidence to the effect fails to prove the impossibility of a policy system in which the exchange market is not pegged and macroeconomic policy is operated so as to force external price disturbances onto the exchange market rather than letting them feed into domestic money prices and costs. If such "aggressive insulation" of the Canadian economy is employed, the flexible policy standard should not be adopted.

Conversely, employment of the flexible policy standard entails the operation of macroeconomic policy as if the Canadian economy were on a regime of fixed exchange rates, however closely (or loosely) the exchange market is managed by the authorities. In terms of the model of "policy assignment", this implies that fiscal policy is relatively effective for the adjustment of aggregate demand, monetary policy for external balance because of its leverage on international capital flows. Thus the flexible standard implies a policy mix in which tax and expenditure policy

carry the main weight of domestic stabilization. The stabilization. The stabilization policy logically would be oriented strictly toward aggregate demand and employment, and not toward the price level per se, because the latter is placed out of reach conceptually by the assumptions of the policy standard and empirically by the market linkages that justify the flexible standard in the first place.

One implication of employing the flexible policy standard is that Canada does not enjoy the option of "choosing a point on the Phillips curve". Rather the inflation rate is given, except for transitory displacements, and unemployment determined at the minimum average level that allows keeping inflation in Canada from running beyond its level abroad. Cheerful advice on the merits of shifting the Phillips curve to attain a lower unemployment rate need not detain us here. It may be tempting to adopt a fixed exchange rate, then get unemployment down by expansive fiscal policy and hope that the associated inflationary pressure is vented abroad. Yet this policy is inevitably short-run because the external value of the currency can be defended only by using reserves; once devaluation is forced the chickens come home to roost and the temporarily exported inflation is, as it were, reimported. Thus there is no possibility of sustaining a lower unemployment rate than is consistent with the world inflation rate, and no substantial advantage for slowing down inflation from a higher rate of unemployment.

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Caves, Richard E.

Price-level targets

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